

What is claimed is:

1. A modular, prosthetic assembly adapted to be inserted through a first bone hole having a first hole diameter and implanted at the site of interest within a bone or joint, said assembly comprising:

a plurality of assembly modules, including at least a first and second modules, each of said plurality of assembly modules configured and dimensioned to be individually inserted through said first bone hole;

wherein said first module provides a portion of a uniform articular surface,
said second module provides a portion of said uniform articular surface,
and said plurality of assembly modules are configured to fit together to form said prosthetic assembly within the site of interest.

2. The prosthetic assembly of claim 1, further comprising:

a body;

an intramedullary stem extending from said body; and

a plurality of collar modules,

wherein said first module is a cap piece, having a portion of said uniform articular surface, said plurality of collar modules fitting around the cap piece and combining to form the assembly head piece, each of said plurality of collar modules having a portion of said uniform articular surface, said head piece configured and dimensioned to be secured to the body, and said second module is one of the plurality of collar modules.

3. The prosthetic assembly of claim 2, wherein said cap piece has a shaft that extends from said cap piece beneath said uniform, articular surface.

4. The prosthetic assembly of claim 3, further comprising a screw thread on said shaft adapted to be screwed into a hole in said body for securing the cap piece and body together.

5. The prosthetic assembly of claim 3, wherein said uniform articular surface has a convex surface curvature substantially defined by a portion of the surface of a sphere.

5 6. The prosthetic assembly of claim 3, wherein the plurality of collar modules are at least three collar modules fitting together to completely encircle the cap piece and forming said uniform articular surface.

10 7. The prosthetic assembly of claim 6, wherein each of said plurality of collar modules is configured and dimensioned so that when each collar module is positioned around the cap piece, the cap piece is seated into a recess formed by said plurality of collar modules.

15 8. The prosthetic assembly of claim 2, further comprising a screw for attaching the head piece to the body, said screw running through a threaded channel in the body to a threaded hole in at least one of said plurality of collar modules.

20 9. The prosthetic assembly of claim 2, wherein the body has at least one protrusion, which protrusion is dimensioned to fit a complementary hole located in one of said plurality of collar modules, said protrusion providing guidance for attaching the body to said one collar module.

25 10. The prosthetic assembly of claim 2, wherein said stem is modular, said stem comprising:

a terminal stem module, having a first and second end, said first end having a first attachment component;

at least one extender module, having a first and second end, said first end having a first attachment component, said second end having a complementary attachment component; and

30 a proximal stem module, having a first and second end; said second end having said complementary attachment component,

wherein the first attachment component and complementary attachment component are configured such that they cooperate to lock and fix two modules together.

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11. The prosthetic assembly of claim 10, wherein said first attachment component is a threaded screw and said complementary attachment component is a threaded hole which can accept the threaded screw.

5 12. The prosthetic assembly of claim 10, wherein said terminal stem module has a guidewire channel extending longitudinally from the first to second ends, therethrough, of said stem module.

10 13. The prosthetic assembly of claim 12, wherein said terminal stem module has a receptacle on the first end for accepting a complementary bit used for rotatably driving said terminal stem module into an intramedullary canal, said bit fitting into said receptacle.

15 14. The prosthetic assembly of claim 13, wherein said receptacle is an octagonal-sided receptacle, and said bit is an octagonal-sided bit.

20 15. The prosthetic assembly of claim 10, wherein said extender module includes a guidewire channel extending longitudinally from the first to second ends, therethrough, of said extender module.

25 16. The prosthetic assembly of claim 15, wherein said extender module has a receptacle on the first end for accepting a complementary bit used for rotatably driving the extender module into an intramedullary canal.

30 17. The prosthetic assembly of claim 16, wherein said receptacle is an octagonal-sided receptacle, and said bit is an octagonal-sided bit fitting into said receptacle.

35 18. The prosthetic assembly of claim 10, wherein the proximal stem module includes a channel within the stem having a first opening and a second opening on said stem, said channel positioned at an angle to the length of the stem, said channel having an inner thread for accepting a threaded screw.

19. The prosthetic assembly of claim 10, wherein the first attachment component is a protrusion, and the complementary attachment component is a recess, the protrusion and recess configured to lock two modules of the stem together in an interference fit.

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20. The prosthetic assembly of claim 2, wherein the body comprises a cage, the space inside the cage permitting placement of bone ingrowth materials to allow fixation with the exterior environment in which the cage is implanted.

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21. The prosthetic assembly of claim 2, wherein the plurality of collar modules each have first and second flat contact surfaces, said first and second contact surfaces each having at least two magnets, and said magnets disposed to require proper alignment between said collar modules during assembly within the site of interest.

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22. The prosthetic assembly of claim 2, wherein the stem exterior which contacts the intramedullary canal has a textured surface which promotes bone fixation.

23. The prosthetic assembly of claim 2, wherein the non-articular, exterior surface of the body has a textured surface which promotes bone fixation.

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24. The prosthetic assembly of claim 1, further comprising:
an intramedullary stem; and
a plurality of collar modules,

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wherein said first module is a body, said stem extending from said body, said second module is one of the plurality of collar modules, each collar module having at least a portion of an articular surface, said plurality of collar modules configured to fit around said body, and the combination of body and collar modules forming said uniform, articular surface.

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25. The prosthetic assembly of claim 24, wherein said uniform articular surface has a convex surface curvature substantially defined by a portion of the surface of a sphere.

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26. The prosthetic assembly of claim 24, wherein said plurality of collar modules include at least three collar modules that, when attached around the body, form with the body the uniform, articular surface.

5 27. The prosthetic assembly of claim 24, wherein each collar module has a dovetail, and said body has corresponding grooves to accept each dovetail from each collar module.

10 28. The prosthetic assembly of claim 24, further comprising a threaded shaft for attaching the body to the stem, said shaft inserted through the body and received into the stem.

15 29. The prosthetic assembly of claim 24, wherein each of the plurality of collar modules has a first contact surface and a second contact surface, each of said first and second contact surfaces having at least one magnet placed in the surface to facilitate alignment between collar modules, during assembly within the site of interest.

20 30. The prosthetic assembly of claim 24, wherein the stem exterior surface which contacts the intramedullary canal has a textured surface which promotes bone fixation.

25 31. The prosthetic assembly of claim 24, wherein the non-articular, exterior surface of the body has a textured surface which promotes bone fixation.

32. A modular, prosthetic assembly comprising:
a terminal module configured for placement in an intramedullary canal, having a first and second end, said first end having a first attachment component; and
at least one extender module configured for placement in the intramedullary
30 cannal, having a first and second end, said first end having a first attachment component, and said second end having a complementary attachment component,
wherein the first attachment component and complementary attachment component are each configured such that they cooperate to lock and fix two modules
35 together.

33. The prosthetic assembly of claim 32, further comprising:
a proximal stem module, having a first and second end, which second
end has a complementary attachment component.

5 34. The prosthetic assembly of claim 32, wherein said first attachment
component is a threaded screw and said complementary attachment component is a
threaded hole which can accept the threaded screw.

10 35. The prosthetic assembly of claim 32, wherein said terminal module has
a guidewire channel extending longitudinally from the first to second ends,
therethrough, of said stem module.

15 36. The prosthetic assembly of claim 32, wherein said terminal module has
a receptacle on the first end for accepting a bit used for rotatably driving the stem
module into an intramedullary canal, said bit fitting into said receptacle.

37. The prosthetic assembly of claim 36, wherein said receptacle is an
octagonal-sided receptacle, and said bit is an octagonal-sided bit.

20 38. The prosthetic assembly of claim 32, wherein said extender module has
a guidewire channel extending longitudinally from the first to second ends,
therethrough, of said extender module.

25 39. The prosthetic assembly of claim 32, wherein said extender module has
a receptacle on the first end for accepting a bit used for rotatably driving the extender
module into the intramedullary canal, said bit fitting into said receptacle.

30 40. The prosthetic assembly of claim 39, wherein said receptacle is an
octagonal-sided receptacle, and said bit is an octagonal-sided bit.

35 41. The prosthetic assembly of claim 32, wherein the first attachment
component is a protrusion, and the complementary attachment component is a recess,
the protrusion and recess configured to lock two modules of the stem together in an
interference fit.

42. A modular, prosthetic assembly comprising:
a cap piece, having a surface part that defines at least a portion of a convex, uniform, articular surface; and
a plurality of collar modules that fit around the cap piece, combining to form the assembly head piece, each of the plurality of collar modules defining a portion of said uniform, articular surface,
wherein the plurality of collar modules are fixedly attached to the cap piece, forming the prosthetic head assembly.
43. The prosthetic assembly of claim 42, wherein said uniform articular surface has a convex, surface curvature substantially defined by a portion of the surface of a sphere.
44. The prosthetic assembly of claim 42, wherein said cap shaft is attached to a portion of said cap piece which is not an articular surface.
45. The prosthetic assembly of claim 44, wherein said plurality of collar modules are at least three collar modules, which modules, when attached around the cap piece and cap stem, form said uniform articular surface.
46. The prosthetic assembly of claim 45, wherein each of said plurality of collar modules is configured and dimensioned so that when the plurality of collar modules are positioned around the cap piece, the cap piece is seated into a recess formed by the plurality of collar modules.
47. The prosthetic assembly of claim 42, wherein the body has at least one guiding protrusion, which protrusion is dimensioned to fit a complementary hole located in the collar module.
48. The prosthetic assembly of claim 42, wherein each of the plurality of collar modules has a first contact surface and a second contact surface, each of said first and second contact surfaces having at least one magnet placed on the surface to facilitate alignment between collar modules during assembly within the site of interest.

49. A modular, prosthetic assembly comprising:

a glenoid body having a concave, articular surface, said body comprised of at least two sub-component modules,

wherein the body provides an exterior, front-to-back surface profile having at least one step to provide improved seating into and fixation with a scapula, said profile intended to be seated into a complementary recess profile in the scapula matching the exterior, front-to-back, stepped, surface profile to provide tight seating to the body.

50. The assembly of claim 49, further comprising:

at least one screw emanating from the body, said screw turned into the scapula to fix the glenoid body to the scapula.

51. The assembly of claim 49, wherein the concave articular surface has a vertical dimension greater than the horizontal dimension, wherein the vertical direction is defined as the direction from a person's toe to head, and the glenoid body is implanted substantially in a direction such that its said vertical dimension is aligned with the person's vertical body direction.

52. The assembly of claim 51, wherein the concave, articular surface has a curvature which is substantially defined by a portion of the surface of an ellipsoid.

53. The assembly of claim 52, wherein said concave ellipsoid curvature has a circumferential edge that lies in a plane, said circumferential edge of the articular surface defined substantially by an ellipse.

54. A modular, prosthetic assembly adapted to be inserted through a first bone hole having a first hole diameter and implanted at the site of interest within a bone or joint, said assembly comprising:

a modular, articular head having a plurality of modules, including at least a first and second module, said first module having a portion of a uniform, convex articular surface, said second module having a portion of said uniform, convex articular surface; and

an opposing base having a concave, articular surface, said base comprised of at least two sub-component modules,

wherein said first and second modules assembled together provide a combination having at least one dimension larger than the first hole diameter.

55. The prosthetic assembly of claim 54, wherein said articular head is a humeral head, said base is a glenoid implant providing an exterior, front-to-back surface profile having at least one step to provide improved seating into and fixation with a scapula.

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